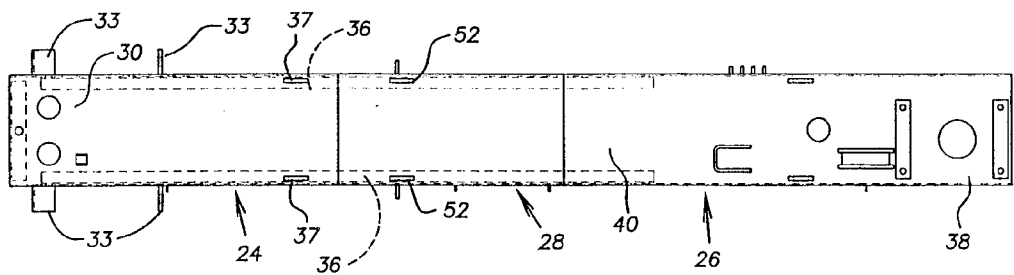




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : F23J 3/02	A1	(11) International Publication Number: WO 98/25080 (43) International Publication Date: 11 June 1998 (11.06.98)
(21) International Application Number: PCT/US97/22205 (22) International Filing Date: 5 December 1997 (05.12.97) (30) Priority Data: 08/761,240 6 December 1996 (06.12.96) US (71) Applicant (for all designated States except US): COPES-VULCAN, INC. [US/US]; Martin and Rice Avenues, Lake City, PA 16423 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): PARKIN, Gregory, A. [US/US]; 2836 Presta Court, Erie, PA 16506 (US). GRAY, Ronald, M. [US/US]; 10412 Silverthorn Road, Edinboro, PA 16412 (US). (74) Agents: SOPKO, Jeffrey, J. et al.; 1200 Leader Building, Cleveland, OH 44114 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i>
(54) Title: MODULAR SOOT BLOWER HOUSING ASSEMBLY  (57) Abstract A modular housing assembly (22) for a soot blower (10) including a rear housing section (26), a front housing section (24), and an intermediate housing section (28) between the front and rear sections (24, 26). The front and rear housing sections (24, 26) have a predetermined and fixed length regardless of the combined length of the soot blower housing sections. The intermediate housing section (28) has a length which corresponds to the combined length of the housing sections.		

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1 **MODULAR SOOT BLOWER HOUSING ASSEMBLY**

2 **BACKGROUND OF THE INVENTION**

3 The present invention generally relates to soot
4 blowers and, more particularly, to soot blower housing
5 assemblies.

6 **DESCRIPTION OF RELATED ART**

7 In the past, soot blower housings have generally been
8 large, one-piece assemblies to which the various soot
9 blower components are mounted. Soot blowers are
10 manufactured in various lengths corresponding to the
11 required lance tube travel. Accordingly, soot blower
12 housings have, in the past, been manufactured in a
13 corresponding number of lengths.

14 The manufacture and storage of numerous lengths of
15 soot blower housings is labor-intensive and inefficient,
16 but has been undertaken in the past due to a lack of viable
17 alternatives. Therefore, there exists a need in the art
18 for a soot blower housing assembly which improves
19 manufacturing efficiency, and whereby soot blowers of
20 various lengths can be manufactured without unnecessary
21 duplication.

22 **SUMMARY OF THE INVENTION**

23 The present invention is directed toward an improved
24 soot blower housing assembly which has better manufacturing
25 efficiency, and which simplifies the manufacture of soot
26 blowers. The present invention is also directed toward a
27 soot blower housing assembly which is modular in design and
28 which permits pre-assembly of various soot blower
29 components. The present invention is further directed
30 toward a soot blower housing assembly which is adapted to
31 be made any of a variety of lengths by simply using an

1 intermediate section of a length corresponding to the
2 desired soot blower housing assembly length.

3 In accordance with the present invention, the soot
4 blower housing comprises a first or rear housing section,
5 a second or intermediate housing section, and a third or
6 front housing section. The front and rear housing sections
7 have a fixed length regardless of the combined length of
8 the soot blower housing. The intermediate housing section
9 has a length which corresponds to the combined length of
10 the soot blower housing.

11 In further accordance with the present invention, the
12 rear and front housing sections are manufactured without
13 regard to the soot blower length, and can be preassembled
14 as sub-assemblies. The intermediate housing section length
15 corresponds to a desired soot blower housing assembly
16 length. The intermediate section has a pair of mounting
17 rails secured thereto. One end of the mounting rails is
18 secured to the front housing section and an opposite end of
19 the mounting rails is secured to the rear housing section.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

21 These and further features of the present invention
22 will be apparent with reference to the following
23 description and drawings wherein:

24 FIG. 1a is a top plan view of a soot blower
25 incorporating a soot blower housing assembly according to
26 the present invention;

27 FIG. 1b is a cross sectional view of the soot blower
28 as seen along line 1b-1b in FIG. 1a;

29 FIG. 2a is a top plan view of the soot blower housing
30 assembly;

31 FIG. 2b is a side elevational view of the soot blower
32 housing assembly;

33 FIG. 2c is an end elevational view of the housing
34 assembly;

35 FIG. 3a is a top plan view of a rear housing section

1 assembly;

2 FIG. 3b is a side elevational view of the rear housing
3 section assembly;

4 FIG. 3c is an end elevational view of the rear housing
5 section assembly;

6 FIG. 4a is a top plan view of a front housing section
7 assembly;

8 FIG. 4b is a side elevational view of the front
9 housing section assembly;

10 FIG. 4c is an end elevational view of the front
11 housing section assembly;

12 FIG. 5a is a top view of an intermediate housing
13 section assembly;

14 FIG. 5b is a side elevational view of the intermediate
15 housing section assembly; and,

16 FIG. 5c is an end elevational view of the intermediate
17 housing section assembly of the soot blower housing.

18 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

19 It is initially noted that various aspects of the
20 present invention may be illustrated in the drawing figures
21 in a generally schematic fashion. It is further noted that
22 the drawing figures are not necessarily to scale.

23 With reference to FIGS. 1a-1b, a soot blower 10
24 incorporating a modular housing assembly 22 according to
25 the present invention is illustrated. The soot blower
26 includes, in addition to the modular housing, a traveling
27 carriage assembly 12, a lance tube 14, a lance support
28 assembly 16, a drive motor 18, and a cleaning medium supply
29 system 20. It is submitted that the various components of
30 the soot blower 10, except for the modular housing assembly
31 22, are secured to the modular housing assembly 22 but do
32 not necessarily form a part of the invention, except as
33 noted hereinafter and except for the interrelationship
34 between such components and the modular housing assembly.
35 Therefore, the description hereinafter will be limited, in

1 large part, to the modular housing assembly 22, it being
2 understood that various soot blower components and
3 subassemblies known in the art may be used in conjunction
4 with the modular housing according to the present
5 invention.

6 As shown in FIGS. 2a-2c, the modular housing assembly
7 22 includes a front housing section 24, a rear housing
8 section 26, and an intermediate housing section 28. In
9 accordance with the present invention, and as will be
10 described more fully hereinafter, the front housing section
11 24 has a predetermined length regardless of the desired
12 length of the modular soot blower housing assembly 22.
13 Similarly, the rear housing section 26 has a predetermined
14 length regardless of the desired length of the modular soot
15 blower housing assembly 22. The intermediate housing
16 section 28 can be formed in various lengths, each of the
17 intermediate housing lengths corresponding to a desired
18 length of the modular soot blower housing 22.

19 Each of the front, rear, and intermediate housing
20 sections 24, 26, 28 is generally made from sheet steel
21 which has been bent into a generally upside-down or
22 inverted U-shape. As will be described hereafter, this
23 basic configuration is altered by the formation of a series
24 of holes or apertures, and by the addition of a series of
25 mounting plates or mounting structures, as will be apparent
26 from the drawings and the description to follow. As will
27 be further apparent, the front and rear housing sections
28 24, 26 can be manufactured, in large part, as sub-
29 assemblies and subsequently joined to an intermediate
30 housing section 28 of a desired and appropriate length
31 corresponding to the desired length of the modular soot
32 blower housing 22.

33 The front housing section 24, as shown in FIGS. 4a-4c,
34 has a forward end portion 30 and a rearward end portion 32.
35 The forward end portion 30 is adapted to receive the lance
36 support assembly 16 (Fig. 1b). The forward end portion 30
37 also has a series of laterally-extending flanges 33 to

1 which a cable drive tensioning assembly 34 is secured. The
2 forward end portion 30 also receives a pair of cable
3 pulleys 35 (Fig. 1b) that are associated with the
4 tensioning assembly 34. The rearward end portion 32 of the
5 front housing section 24 is secured, by means of a pair of
6 traveling carriage guide rails 36, to the intermediate
7 housing section 28, as will be discussed more fully
8 hereinafter. A pair of lifting lugs 37 extend upwardly
9 from the rearward end portion 32.

10 The rear housing section 26, as shown in FIGS. 3a-3c,
11 has a rearward end portion 38 and a forward end portion 40.
12 The rearward end portion 38 has a series of mounting
13 locations for the soot blower drive motor 18, drive cable,
14 drive wheel and blowing medium valve 44 are secured (FIGS.
15 1a-1b). A blowing medium feed pipe extends through a
16 spindle 46 and into the lance tube 14. The spindle 46 and
17 lance tube 14 rotate and longitudinally slide over the feed
18 pipe as the traveling carriage assembly 12 moves forwardly
19 and rearwardly relative to the rear housing section 26 and
20 the feed pipe.

21 The intermediate housing section 28, as noted
22 hereinbefore and shown in FIGS. 5a-5c, has a generally
23 upside-down U-shape and is of a length which corresponds to
24 the length of the soot blower housing assembly 22. The
25 pair of guide rails 36 are secured to a lower interior
26 surface of the lateral side walls of the intermediate
27 housing section 28. The guide rails 36 extend or project
28 from a forward and a rearward end 48, 50 of the
29 intermediate housing section 28. Typically, the guide
30 rails 36 extend further in the forward direction than in
31 the rearward direction, as illustrated. The guide rails 36
32 are generally C-shaped, with the open side of the "C"
33 facing laterally inwardly toward the opposed lateral side
34 wall of the intermediate housing section. A pair of
35 lifting lugs 52 may also be secured to an upper surface of
36 the intermediate housing section upper wall. The lifting
37 lugs 52 are desirable, but may not be necessary in

1 situations wherein the soot blower housing assembly 22 has
2 a length of less than twenty feet.

3 Generally, the front and rear housing sections 24, 26
4 can be preassembled, including any necessary components,
5 and thereafter joined to the appropriately-sized
6 intermediate housing section 28. The projection ends of
7 the guide rails 36 are mechanically secured to the front
8 housing section and the rear housing section. The front,
9 rear, and intermediate housing sections are also welded
10 together at their abutting ends. As such, the assembly of
11 the soot blower is much quicker and easier. Moreover, once
12 the housing sections are secured to one another, the only
13 further assembly required generally relates to tensioning
14 and alignment procedures, and therefore is not difficult to
15 perform.

16 The preferred embodiment of the present invention has
17 been described herein. However, it is considered apparent
18 that the scope of the present invention is not limited to
19 the specific embodiment described. For example, it is
20 contemplated that the modular soot blower housing according
21 to the present invention could readily be used with soot
22 blowers having a different drive scheme than that shown in
23 the drawings. Therefore, the drive mechanism and
24 associated components are not necessary for practicing the
25 invention, but rather are exemplary of one drive mechanism
26 that is preferably used in combination with the present
27 invention. Furthermore, it is contemplated that soot
28 blowers of very short lengths, the intermediate section
29 could be completely removed and the front and rear housing
30 sections directly secured to one another. Furthermore, on
31 very long soot blowers, two or more intermediate housing
32 sections could be used. Rather, the scope of the invention
33 is only defined by the claims appended hereto.

WHAT IS CLAIMED IS:

1 1. A soot blower housing, comprising:
2 a rear housing section;
3 a front housing section; and
4 an intermediate housing section disposed between and
5 interconnecting said front and rear housing sections,
6 wherein said front and rear housing sections have a
7 predetermined, fixed length and said intermediate housing
8 section has a length corresponding to a length of said soot
9 blower housing.

1 2. A soot blower housing according to claim 1,
2 wherein said soot blower housing can be manufactured in a
3 plurality of lengths, and there is a one for one
4 correspondence between soot blower housing length and
5 intermediate housing section length.

1 3. A soot blower housing according to claim 1,
2 wherein said intermediate housing section has a guide rail
3 secured thereto.

1 4. A soot blower housing according to claim 3,
2 wherein said guide rail projects from each end of said
3 intermediate housing section.

1 5. A soot blower housing according to claim 1,
2 wherein said intermediate housing section has a pair of
3 guide rails secured thereto, said guide rails projecting
4 from each end of said intermediate housing section and
5 being secured to said front housing section and said rear
6 housing section.

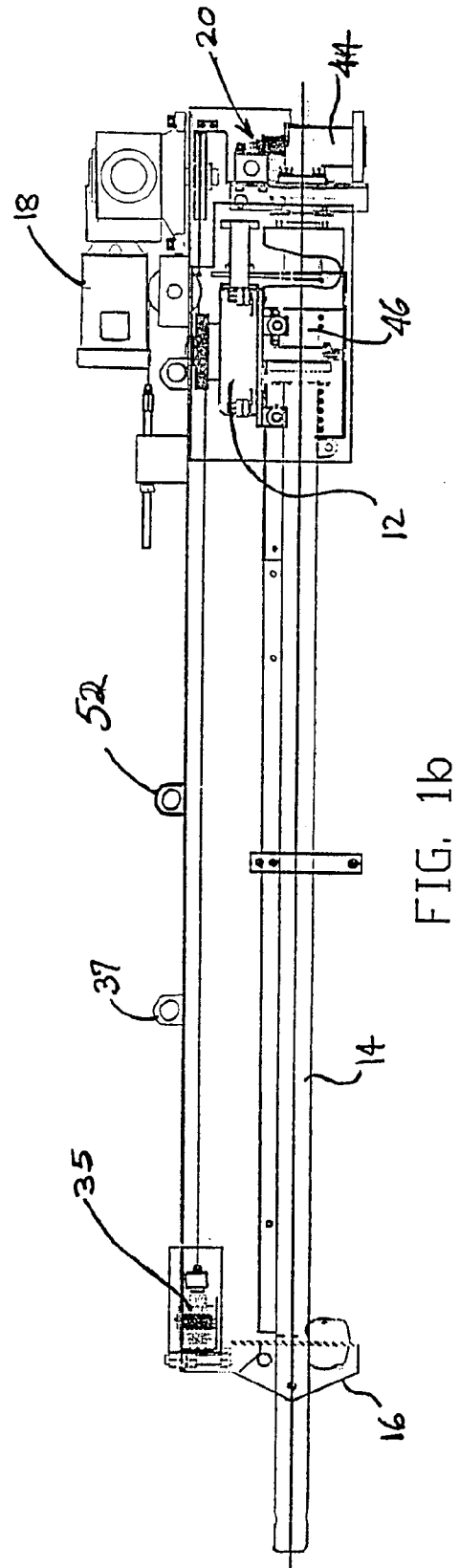
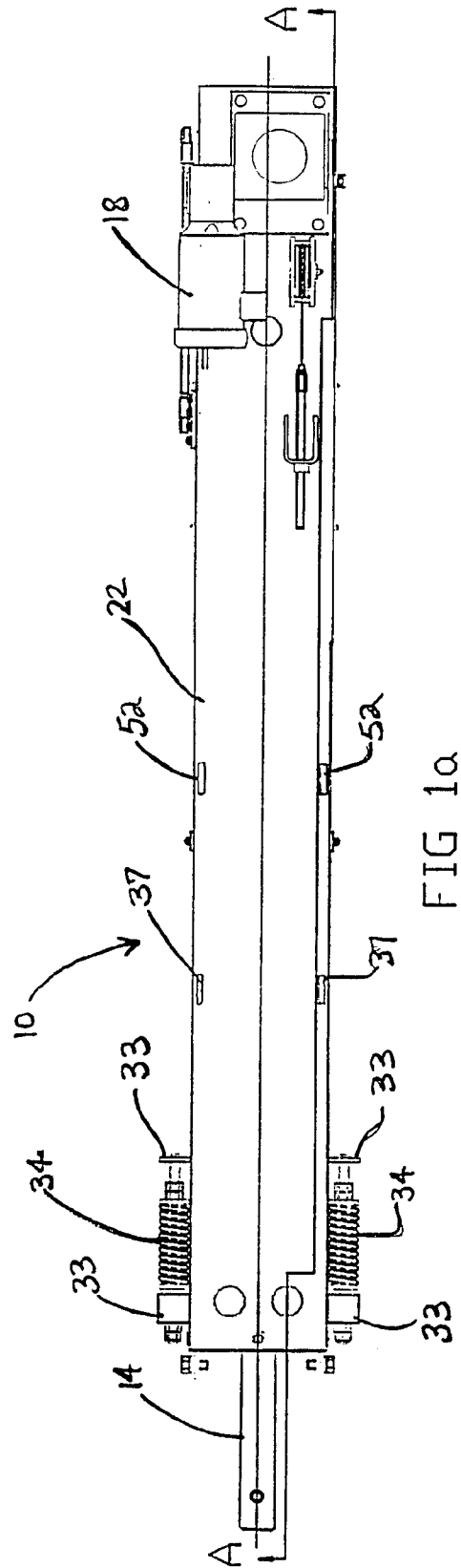
1 6. A method of manufacturing a soot blower housing,
2 comprising the steps of:
3 determining a desired soot blower housing length;

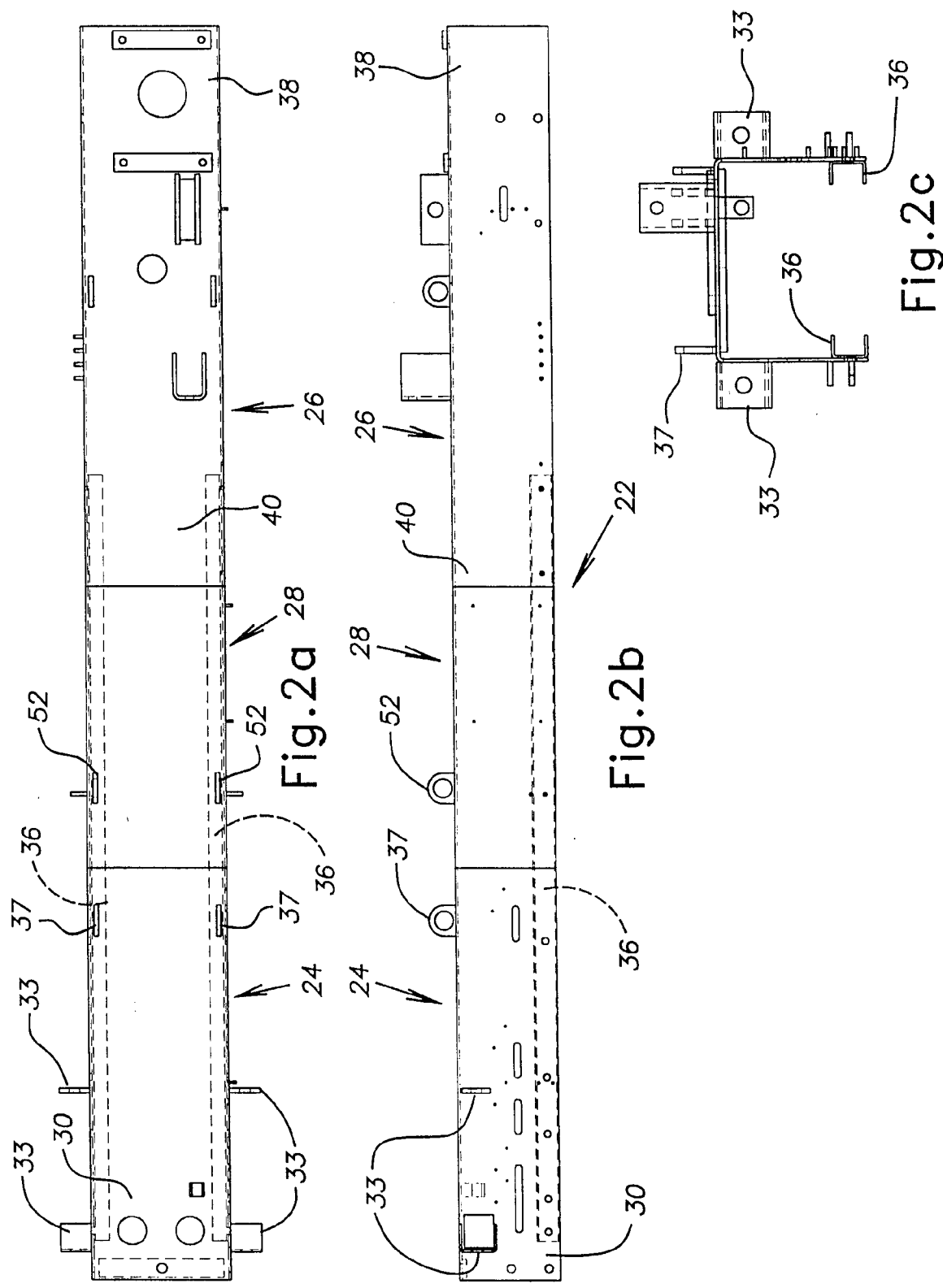
4 providing a rear housing section and a front housing
5 section, said front housing section having a first length
6 and said rear housing section having a second length, said
7 first and second lengths being independent of said desired
8 soot blower housing length; and
9 selecting an intermediate housing section having a
10 length corresponding to the desired soot blower housing
11 length.

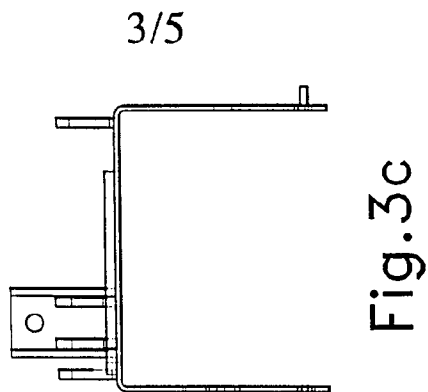
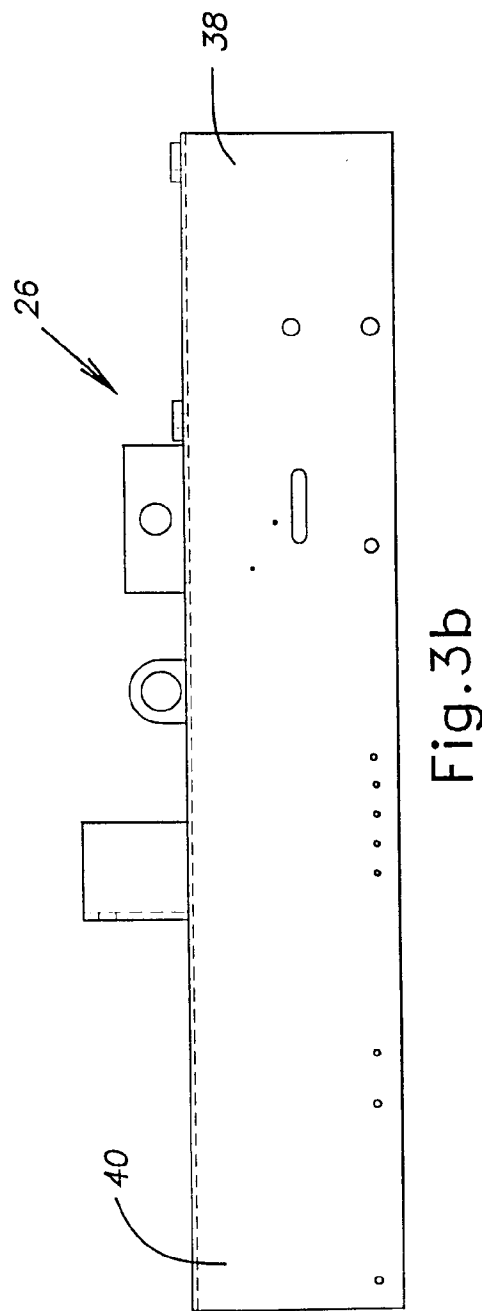
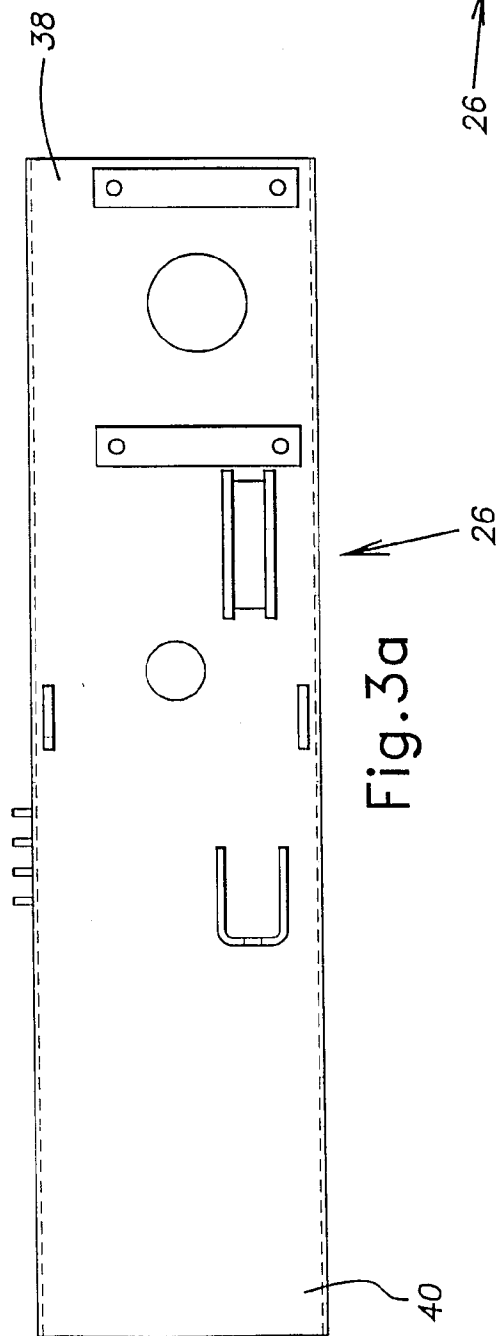
1 7. A method of manufacturing a soot blower housing
2 according to claim 6, wherein said first length and said
3 second length are not equal to one another.

1 8. A method of manufacturing a soot blower housing
2 according to claim 6, wherein there is a one for one
3 correspondence between desired soot blower housing length
4 and intermediate housing section length.

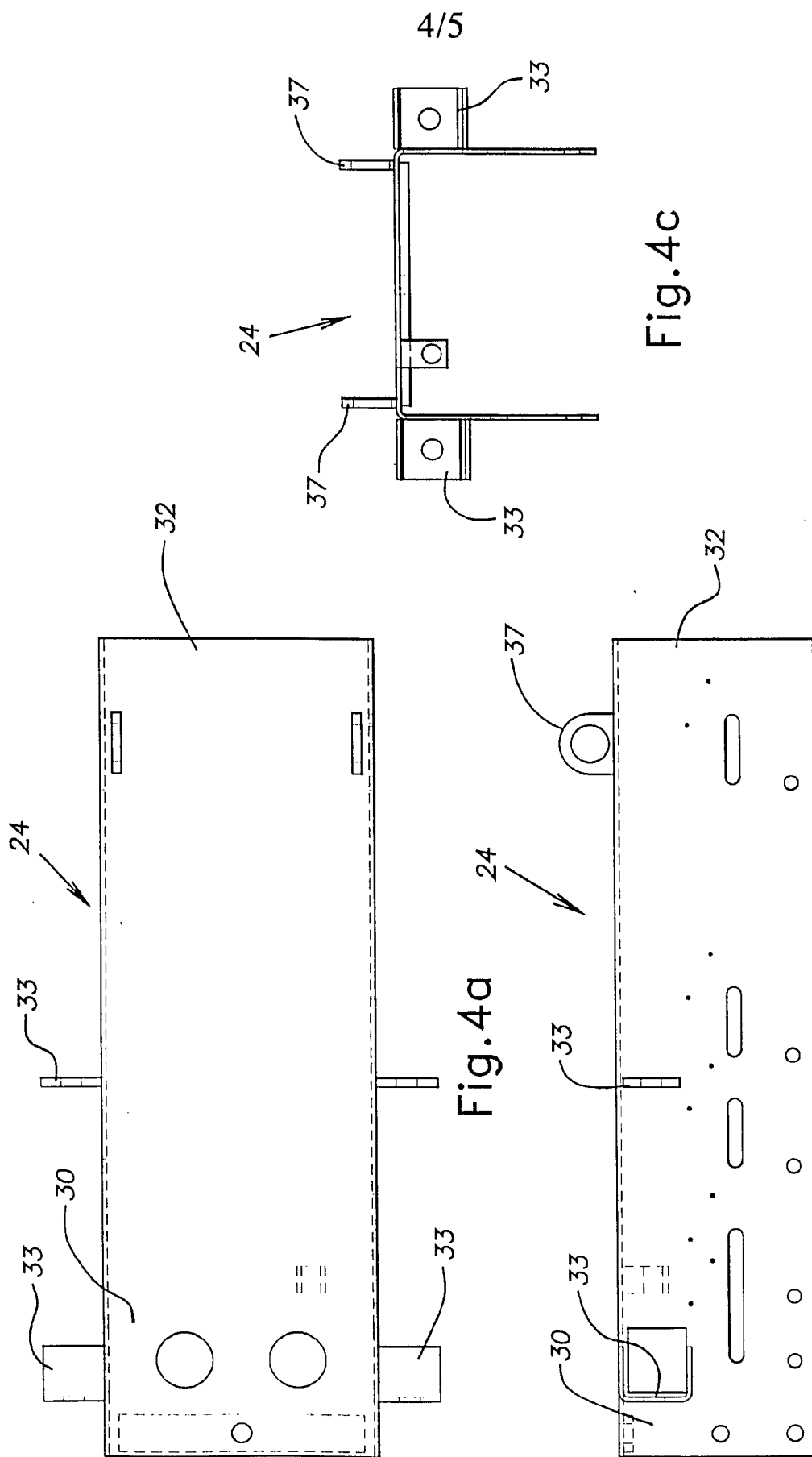
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3/5



4/5

Fig. 4c

Fig. 4a

Fig. 4b

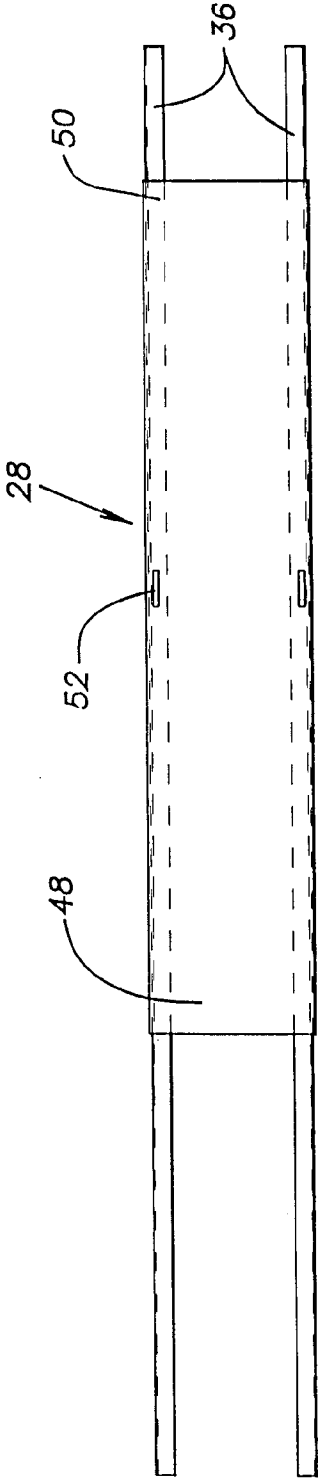


Fig. 5a

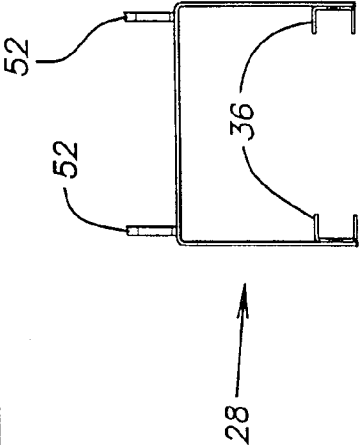


Fig. 5c

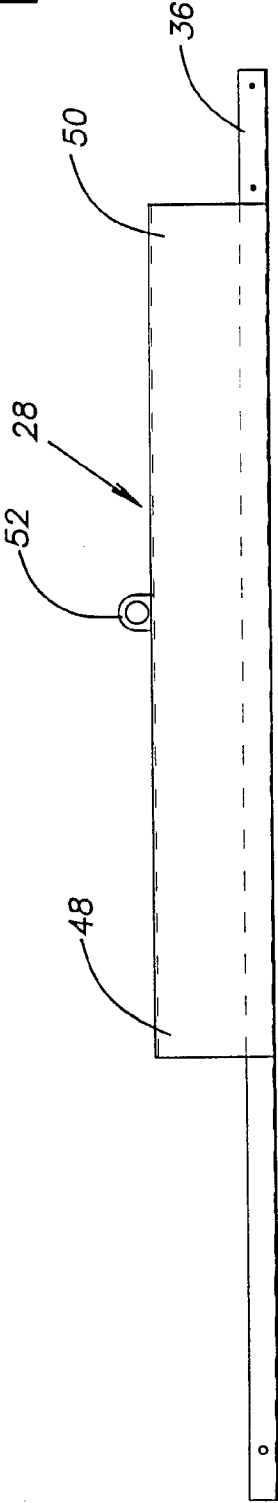


Fig. 5b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/22205

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : F23J 3/02

US CL : 15/316.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 15/316.1, 318, 318.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

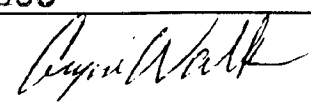
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,299,533 A (JOHNSTON, JR. ET AL) 05 April 1994 (05-04-94), see entire document.	1
A	US 5,337,438 A (BROWN ET AL) 16 August 1994 (16-08-94), see entire document.	1
A	US 5,353,996 A (GALLACHER ET AL) 11 October 1994 (11-10-94), see entire document.	1
A	US 5,365,890 A (JOHNSTON, JR. ET AL) 22 November 1994 (22-11-94), see entire document.	1
A,P	US 5,619,771 A (MINIC) 15 April 1997 (15-04-97), see entire document.	1
A,P	US 5,687,449 A (ZACHAY ET AL) 18 November 1997 (18-11-97), see entire document.	1

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search 12 MARCH 1998	Date of mailing of the international search report 10 APR 1998
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRIS K. MOORE  Telephone No. (703) 308-0651